

WHAT IT TAKES TO BE NOBEL WORTHY

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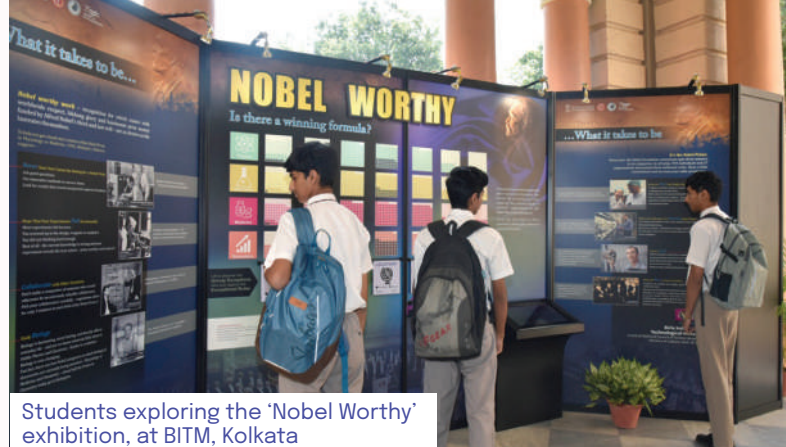
EVERY year, the Nobel Foundation in Stockholm, Sweden, announces up to three winners each in the scientific disciplines of Chemistry, Physics, and Physiology or Medicine, along with those in Literature, Peace and Economic Sciences. As of this year, 954 individuals and 27 organizations have joined the hallowed ranks of Nobel laureates in these categories. And every year, there are numerous discussions — about the laureates as much as their Nobel-worthy works — recognition for which comes with worldwide respect, lifelong glory and handsome prize money funded by Alfred Nobel's third and last will.

But where did it all begin? A premature obituary had inspired the Nobel Prizes. “The merchant of death is dead,” blasted a French newspaper in April 1888, bidding good riddance to Swedish inventor and arms manufacturer Alfred Nobel, who “became rich by finding ways to kill more people faster than ever before”. Pretty harsh words for an obituary, especially when its subject was still very much alive!

But even if the rumours of his demise were greatly exaggerated, the inventor of dynamite was not about to let the details of his legacy be similarly blown out of proportion, and so Nobel set out to ensure that his name would forever be tied to humankind's highest achievements, and not its destructive potential.

Today, the Nobel Prizes are the acme of achievements in the respective fields — honoring great minds and life-changing discoveries. The short list of Nobel Prize nominees is secret — as are the nominators, and documents revealing the details are sealed from public view for 50 years. Hence, predicting who will be summoned to Stockholm and win the accolades, is easy to get wrong.

Can there be a winning formula? Could there be a pattern or even anecdotal analysis of the successful cases? Birla Industrial & Technological Museum (BITM), Kolkata – a Unit of the National Council of Science Museums – attempted to answer this in the form of a new exhibition and panel discussion on 31 October 2022 – innocuously titled ‘Nobel Worthy – what it takes to be’. The Exhibition drew heavily from the advice of laureates – of the stature of Richard J. Roberts (Physiology or Medicine 1993), trends indicated



Students exploring the 'Nobel Worthy' exhibition, at BITM, Kolkata

by over 12 decades of the Prizes themselves (as released by the Nobel Prize Foundation), past achievements and present advances – with ample evidence that went for and against the predictions.

The Winning Formula

To increase one's odds of winning a Nobel, it counsels towards the following with illustrious examples:

1. NEVER Start Your Career by Aiming for a Nobel Prize

- Focus on doing the very best science that you can.
- Ask good questions.
- Use innovative methods to answer them.
- Look for results that may reveal some unexpected aspect of nature.

2. Hope That Your Experiments FAIL Occasionally

Most experiments fail because:

- You screwed up in the design by not thinking hard enough
 - You were not alert during mixing the reagents
 - You were not careful enough in performing the analytics
- Best of all – the current knowledge in the field is wrong and your experiment can be refined to reveal the true nature – prize worthy work indeed!

3. COLLABORATE with Other Scientists

- Collaboration embodies much of what is good about science and makes it fun. By bringing different sets of expertise to bear on a problem, it is often the key to making discoveries.
- Don't make a competitor of someone who would otherwise be an extremely valuable collaborator.
- Pick your collaborators carefully – regulations allow for only 3 winners in each field of the Nobel Prizes!

4. Study BIOLOGY

- Biology is fascinating, never boring, and directly affects everyday life – and yet we know relatively little about it.
- It encompasses disciplines such as Medicine, Agriculture, Conservation, Computer Science – lending itself to the kind of interdisciplinary approaches that make science such fun and can easily lead into new territory.
- Unlike Physics and Chemistry – thanks to evolution – Biology is ever changing. What seems to be the rule today may have changed by the time you are doing your experiments.
- There are two Nobel categories in which biological discoveries are currently being awarded – Physiology

Odd Man Out

Expecting a strong rebuttal, we timidly asked Dr Saikat Sinha Roy, Professor and Head, Department of Economics, Jadavpur University, Kolkata and recipient of the 2022 Shiksha Ratna Award:

"There is an unuttered but admitted belief that Economics is an outsider at the Nobels – and worse still – not a science discipline in popular perception. Do you agree?"

His candid reply:

"Well, we don't! It doesn't matter whether it's a science or not a science. Economics is a blend. It's not exact science – like physics, chemistry, physiology, medical sciences, or biology – though economists including Abhijit Vinayak Banerjee do experiments, whether in the lab or in the field but economics is not against experimentation.

It's a social science that thinks about the society, which talks about this society, which abstracts from the society. It observes nature along with the society and abstracts from it, tries to develop on it and see what is the way out, what is the problem therein and what is the way out. In economics, we do Chaos Theory now, we use Brownian Motion, but we also we use networks and derive lot of inputs from the society. Without society economics cannot survive and that's the prime thing.

In 1895 when Alfred Nobel bequeathed 94 million Swiss Swedish Kroner for the Nobel Foundation, what played in him we don't know. He said in his last will, experts in five subjects should be given Nobel Prize which include physics, chemistry, physiology or medicine, literature and peace. Somehow economics could not make it. But that did not stop economists or economics from thinking or making way forward so and they made it to the Nobel. The people, the economists from whom I learn every day – they have contributed so much, they have worked so much that they have taken this discipline to a new standard which is the Nobel standard and for that, I'm a very happy economist."



Dr Saikat Sinha Roy during Panel Discussion on 'Nobel Worthy' at BITM, Kolkata

...What it takes to be

It's the Nobel Prizes.
Every year, the Nobel Foundation announces up to three winners in six categories. As of today, 954 individuals and 27 organizations have joined these hallowed ranks. Show a little commitment and increase your odds of winning.

- Be Sure to Pick Your Family Carefully.**
Children of Nobel winners & married couples (about 2 million) have won the Prize. With a total of 615 awards during the last 121 years, these are impressive numbers – given a world population numbering at least 10,000,000,000 over the same period of time.
- Work in the Laboratory of a PREVIOUS Nobel Winner.**
10 leading universities in the 4 top countries have about 50% of the Nobel Prizes. Where once someone – a Nobel does not forget another Nobel. You still gain a best-in-class mentorship and training at the workplace.
- Count on Luck.**
Nobel Laureates seem to be a combination of talent, strong motivation, hard work, and a little bit of luck. Many discoveries arise when what we think we know turns out to be wrong. Nobel-worthy work starts from here on.
- Always Be NICE to Senior Scientists.**
Scientists are usually nice people, good mentors, easy to collaborate with. Also, you are not allowed to terminate your work. Members of academies, university professors, scientists, professors, Nobel Prize laureates and members of parliamentary assemblies do it for you – although you will not know about them until 50 years of your Award. Better be nice then.
- Kingston's Prize comes with 66 nominations during 1919-23. On 13 occasions during 1919-23, Einstein mentioned future laureates.**

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or Medicine and Chemistry – about half the Prizes in Chemistry today go to biologists.

- No harm in increasing your odds by 50%.

5. Be Sure to PICK Your Family Carefully

- Nine children of Nobel Prize winners have gone on to win the Prize themselves.
- Six married couples have jointly won the Prize.
- The only siblings to bask in Nobel glory were Jan Tinbergen (Economics 1969) and Nikolaas Tinbergen (Medicine, 1973).
- With a total of 989 Nobel Prize recipients in science during the 121 years since it was first awarded, these are impressive numbers, given a world population numbering at least 10,000,000,000 over the same period of time.
- This rule is vividly illustrated this year by another Nobel in the family for Svante Pääbo (Medicine, 2022), after his father Sune Bergström's 1982 Nobel – in the same field.

6. Work in the Laboratory of a PREVIOUS Nobel Winner

- There are about 18 leading universities in the 4 top countries whose researchers have gained about 50% of the Nobel Prizes.
- In some cases, universities have developed specialisation in certain fields; e.g., the University of Chicago is leading in Nobel Prizes awarded in Economics.
- Worst case scenario – a Nobel does not beget another Nobel. You still gain a best-in-its-class mentorship and training at the workplace.

Snapshot from the
Exhibition Brochure

Excellence Breeds Excellence

To find out the importance of building the right academic ecosystem for a Nobel worthy achievement, we asked Dr Soumitro Banerjee, Professor at the Department of Physical Sciences, Indian Institute of Science Education and Research, Kolkata, the 2003 Shanti Swarup Bhatnagar Prize awardee, an IEEE Fellow and certified to be among the top 2% scientists today:

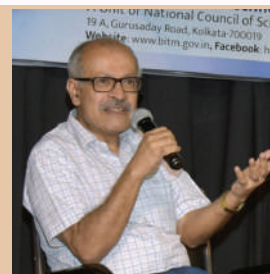
"About 10 western countries have won about 90% of the Nobel Prizes in science. Scientists working at 18 universities in just 4 countries have received about 50% of all the scientific Nobel Prizes. Is this an indication of the brain migration at play in the basic sciences?"

His reply:

"Modern science, as we know it, is a result of renaissance which happened in Europe and whose benefits also percolated to the United States and the other countries. Whether or not they were able to shine to that level depends on how much the ethos of enlightenment as it's called are reflected in the culture of the country. It means whether or not the majority of people acquire a scientific bent of mind, they value science that is a part of the culture. When children grow up, they absorb the material of thought from the society around them and if that Society is not primarily scientific then their mindset does not grow in a way conducive to do high quality science. Create an education system that cultivates this and then maybe we'll be able to shine to their levels.

But factor is not only brain drain. The number of people who migrated and then won a Nobel Prize in foreign Universities is not overwhelmingly large. But a powerful factor is the quality of science that is practiced in those Universities, the kind of ambience they have. Excellence breeds excellence. So if you have an ambience in the schools, colleges, universities that breeds excellence then there is a possibility of a larger number getting to the level of Nobel.

So why do we not have Nobel Prizes from say Congo or Bali or Indonesia? The reason is definitely not that these people have genetically inferior composition. No, definitely not. We are the same species. What makes a difference is the culture. What makes the difference is how much patronage science or academies receive from the government. The question is of the right ecosystem – and the right ecosystem is a function of a cultural history."



Dr Soumitro Banerjee, during Panel Discussion on 'Nobel Worthy' at BITM, Kolkata

wore the weirdest of glasses and Wilhelm Rontgen (Physics, 1901) who probably sported the longest beard.

It celebrates the fact that gender and racial diversity of the Nobels are on the rise. In the first century of the Nobels, only 30 women laureates were awarded. In comparison, in the past two decades, 31 women have already received the Prize. Similarly, countries like Morocco (Serge Haroche, Physics, 2012), (Tawakkol Karman, Peace, 2011), Tanzania (Abdulrazak Gurnah, Literature, 2021) and Philippines (Maria Ressa, Peace, 2021) are having increasing representations at the podium.

Why Does It Matter At All

There is no other prize in the intellectual realm that competes with the aura and prestige associated with the Nobel Prizes. They also have a visibility that can hardly be compared to any other. But why are they important? What do they contribute to society?

In an age in which we are gradually losing whole sets of values, fundamentally humanistic ones, the Nobel Prizes are one of our last bastions. We seek in them a reference, not

only of excellence, but of honesty, enthusiasm, commitment to ideals, that inspires both laymen and professionals. Many of the winners were recognized among their peers as unique individuals, long before they were awarded the Prize. And afterwards they have continued to behave like people with great human qualities. That is why knowing about their circumstances, their struggles, perhaps their failures – individually or collectively – helps us place their achievements and ultimate Nobel success in a more tangible perspective.

This is a light-hearted take on getting one Nobel Worthy by revealing what it takes to be – the exhibition is meant to make you laugh, then think. It is meant to inspire action – from the young, and not so young – both. These true tales are real. They have happened once. They will happen again. All that remains in between is the tenacity to work hard, look deep and dream big. Nobel or no Nobel, these traits are definitely worth celebrating!

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